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Progress was made during the course of the Grant on the application of Order Statistics and Neural Network modeling to analysis of the onset of retinal lesions. Several medical applications of WMMR filters were initiated, leading to a number of publications and conference presentations by the PI and his co-workers.

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"Analysis of Visual Loss From Retinal Lesions"

P.I. Dr. Harold Longbotham,
Nonlinear Signal Processing Lab
University of Texas at San Antonio

September 23,1992

Program Manager Dr. Jon Sjogren

The following contains:

(1) A list of the journal papers, conference papers, and invited lectures for the past year,

(2) Report of inventions and subcontracts.

Invited Journal Papers:

"Statistical Properties, Fixed Points, and Decomposition With the WMMR Filters," Harold Longbotham, David Eberly, invited paper for special issue of the Journal on the Mathematics of Imaging and Vision", accepted to be published, Dec., 1992.

Refereed Journal Papers:

"Statistical Properties, Fixed Points, and Decomposition With the WMMR Filters," Harold Longbotham, David Eberly, invited paper for special issue of the Journal on the Mathematics of Imaging and Vision", accepted for publication, Dec., 1992.

"The WMMR Filters: A Class of Robust Edge Enhancers," Harold Longbotham. David Eberly, accepted for publication in IEEE SP, March, 1993.

Refereed Journal Papers in Review:

" Fixed Points of Order Statistic Filters," David Eberly, Harold Longbotham, in revision for IEEE SP, submitted Feb. 1991.

"Nonlinear Filtering of Evoked Potentials," Harold Longbotham, Randy Glickman, Daniel Shelton, Wayne Wooten, submitted to the JOSA A special issue on Noninvasive Assessment of the Visual System, Aug. 1992.

"Application of a Neural Network for detection of Proximal Surface Dental Carries," Dove, B., Gay, L., McDavid, D., and Longbotham, H.G., submitted to Oral Surgery, Oral Medicine, Oral Pathology, March 1992.

Panel Discussions:

Phonocardiography Research Conference, Cardiology Service, Brooke Army Medical, March 4-5, 1992.

Artificial Neural Network Panel, SouthWest Research Institute, Summer 1990.

Refereed Conference Papers:

"Nonlinear Operators, Linear Over the PICO Signals", Harold Longbotham, David Eberly, Walter Richardson, and Dmitry Gokhman, accepted to be presented at and published in the proceedings of the Mathematics of Signal Processing Conference, Warwick, England, Dec. 15-17, 1992.

"Robust Norms for Robust Filters," Harold Longbotham, presented at and published in the proceedings of the CCECE'92, IEEE Society meeting of Canada, Sept., 1992

"Nonlinear System Theory for PICO Signals", Harold Longbotham, presented at and published in the proceedings of the CCECE'92, IEEE Society meeting of Canada, Sept., 1992

"Comparison of Four Methods of Image Decomposition," Tom Arnow, Joseph Havlicek, Dmitry Gokhman, Harold Longbotham, presented at and published in the proceedings of the CCECE'92, IEEE Society meeting of Canada, Sept., 1992

"Design of Optimal Linear Operators for the Haar Basis," Harold Longbotham, Walter Richardson, Dmitry Gokhman, presented at and published in the proceedings of the Wavelets and Applications Conference, Toulouse, France, June 1992

"Multiscale Wavelet Analysis of Mammograms," Walter Richardson, Harold Longbotham, Dmitry Gokhman, presented at and published in the proceedings of the Wavelets and Applications Conference, Toulouse, France, June 1992

"Robust Time Domain Frequency Analysis," Daniel Shelton, Harold Longbotham, presented at and published in the proceedings of the SPIE/IS&T Conference on Image Processing (Nonlinear Signal Processing III), San Jose, California, 1992

"A Class of Robust Nonlinear Filters for Signal Decomposition Utilizing the Haar Basis," Harold Longbotham, presented at and published in the proceedings of the IEEE ASSP Conference, San Francisco, California, March, 1992

"Fixed Points and Convergence Properties of Some Ordering Based Filters," Harold Longbotham, David Eberly, presented at and published in the proceedings of the SPIE/IS&T Conference on Image Processing (Nonlinear Signal Processing III), San Jose, California, 1992

" An Application of WMMR filters to Detection and Sizing of Tumors in Mammograms," Amy Glatt, Harold Longbotham, Thomas Arnow, Daniel Shelton, Peter Ravdin, presented at and published in the proceedings of the SPIE Conference on Medical Imaging, San Jose, California, Feb. 1992.

"Comparison of Sensor Configuration for Presentation of Data to an ANN in 2-D Pattern Recognition," Thomas L. Arnow and Harold Longbotham, presented at and published in the proceedings of the ANNIE '91, the International Conference on Artificial Neural Networks in Engineering, St. Louis, Missouri, Nov., 1991